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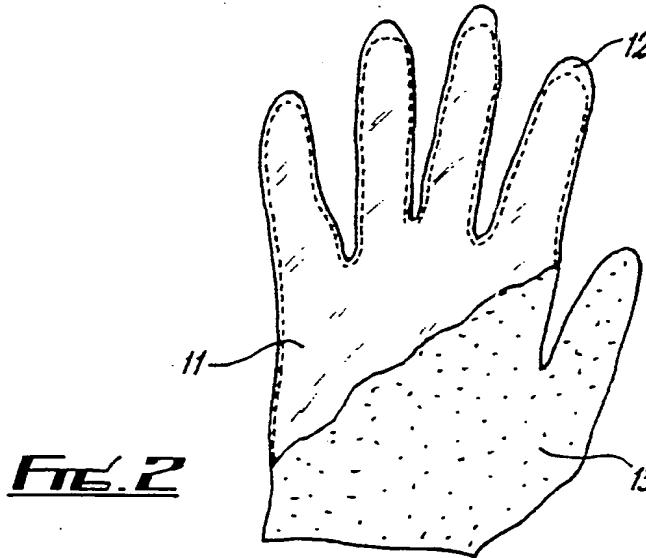
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None

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## (54) MAKING A MULTI-LAYER GLOVE

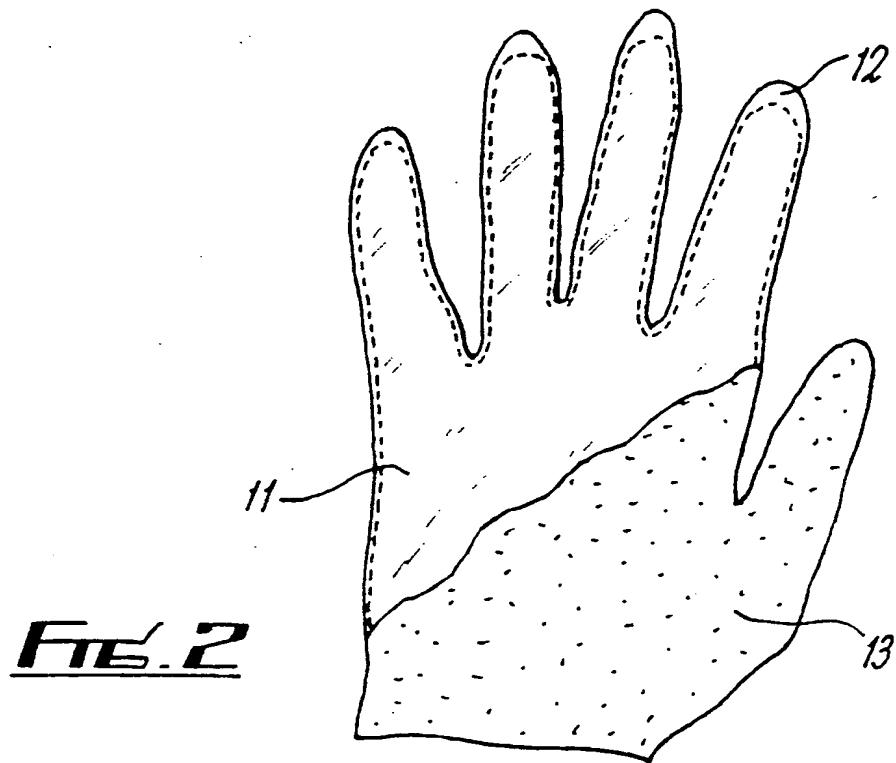
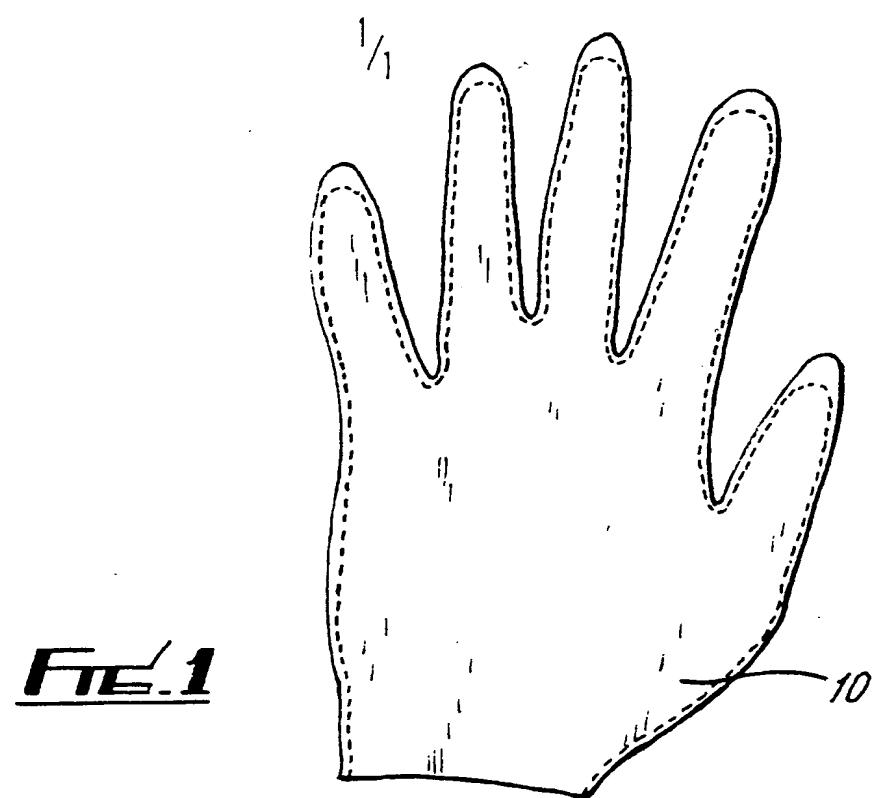
(57) A method of making a heat-resistant glove comprises the steps of providing a first inner glove lining (10), locating a heat degradable adhesive film over the inner glove, locating a breathable waterproof membrane 11 over the film and heating so as to degrade the adhesive film and provide a plurality of isolated areas of adhesive 13, bonding the membrane 11 to the inner lining (10). A leather, or other outer protective layer is provided over the membrane after the heating. Preferably the membrane 11 is held in place during heating by a removable outer lining.



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995



METHOD OF MAKING A HEAT RESISTANT GLOVE

The present invention relates to a method of making a glove for protecting a hand that is subject to intense heat, such as gloves which are used by fire fighters.

Conventional gloves for fire fighters comprise an outer protective layer made conventionally from leather, an inner lining and a breathable waterproof membrane provided between the outer layer and inner lining. During manufacture the material for forming the three layers of the glove is cut into a hand shape and sewn to a similarly shaped piece of material around the periphery thereof. Tabs are provided at the ends of each of the five fingers of the breathable membrane. The tabs on the membrane are sewn to the lining in order to secure the membrane to the lining. The membrane is then inverted so as to cover the inner lining. It is not possible to secure a further outer layer in this manner as it is not possible to provide a further set of integral tabs on the membrane. The outer protective layer is therefore secured in place by adhesive tape.

These gloves are expensive to produce and purchase. Therefore it is highly desirable that the gloves be cleanable. Unfortunately the adhesive tape is not dry cleanable as the dry cleaning fluids attack and degrade the adhesive tape. Furthermore the inner lining is not secured to the membrane in a satisfactory manner. Removing the hand from the glove puts strain on the points of attachment of the tabs and leads

to breakdown of the connection between the inner lining and membrane. On attempting to remove the hand from the glove relative movement of the three layers of the glove results. This hinders removal and insertion of the hand from the glove.

The present invention has been made from a consideration of these problems.

According to a first aspect of the present invention there is provided a method of making a glove comprising the steps of providing a first inner glove, locating an adhesive film over the inner glove, the film being degradable by heat so as to form a plurality of isolated adhesive areas, locating a glove comprising a waterproof, vapour permeable membrane over the film, heating so as to degrade the film and provide a plurality of isolated areas of adhesive, bonding the membrane to the inner sleeve, the method further comprising the step of providing an outer protective layer over the membrane.

According to a second aspect of the present invention there is provided a glove comprising an inner liner, a waterproof, vapour permeable membrane secured thereto and an outer protective layer located above the membrane, characterised in that the membrane is secured to the inner liner by a plurality of isolated areas of adhesive.

The adhesive provides a superior bonding between the

inner layer and the membrane without adversely affecting the performance of the breathable membrane. The adhesive film is ideally glove shaped. This provides an even distribution of adhesive on the inner layer. The adhesive film preferably comprises a web of thermoplastic adhesive. An example material is a polyamide web, which may be woven, knitted or spun bonded. A preferred material is that marketed under the trade mark VILENE.

Ideally the method of the invention is carried out by locating the successive layers of the glove on a former. The former may be made from ceramic or metal. All of the layers of the glove located on the former are therefore ideally glove shaped.

During manufacture of the glove an additional glove shaped layer is preferably located over the membrane in order to ensure that the membrane is held tightly against the adhesive during heating.

The breathable material may comprise any suitable material such as material marketed under the trade marks GORETEX (based on P.T.F.E.) or PORELLE (based on polyurethane).

The inner layer provides comfort to the user. It may comprise any natural or synthetic material. This layer optionally provides additional heat resistance.

The outer protective layer conventionally comprises leather. The outer layer may be secured in place by using a heat degradable film. Alternatively tabs are provided at the fingertips of the membrane and/or the fingertips of the inside of the leather protective layer. The membrane and protective layer can then be secured together, for example, by sewing using the tabs.

The gloves of the invention are readily dry cleanable.

In order that the present invention may be more readily understood a specific embodiment thereof will now be described by way of example only with reference to the accompanying drawings in which:-

Fig.1 shows the inner layer of one glove in accordance with the present invention; and

Fig.2 shows a partially constructed glove in accordance with the present invention.

Referring to the drawings a fire fighter's glove is made by locating a first layer of lining material 10, as shown in Fig.1, on a metal or porcelain former. The lining 10 is cut and sewn into a glove shape.

A glove shaped heat degradable adhesive film, made for example from VILENE (trade mark) is located over the lining

10. A glove shaped waterproof vapour permeable membrane 11 is located over the film. Tabs 12 are provided at the fingertips of the membrane, the purpose of which will be described later. An additional glove shaped lining is then located over the membrane 11 in order to hold the membrane tightly against the adhesive film. The former is then passed through the oven for say 2 to 3 minutes at 200°C or 30 minutes at 100°C. This melts the adhesive film causing the film to degrade to provide a plurality of isolated spots of adhesive 13 which are substantially evenly distributed over the face of the lining. The glove construction is shown in Fig.2. The glove is then allowed to cool and the outer lining is removed. The glove is then removed from the former.

An outer protective glove shaped layer made from leather is provided. The membrane tabs 12 are secured to the seam of the leather glove at the fingertips of the leather glove. The leather protective layer is then rolled over the remainder of the glove to provide the completed glove. Manufacture of the glove is finished in conventional fashion with the optional addition of knitwristing.

It is to be understood that the above described embodiment is by way of illustration only. Many modifications and variations are possible.

CLAIMS

1. A method of making a glove comprising the steps of providing a first inner glove, locating an adhesive film over the inner glove, the film being degradable by heat so as to form a plurality of isolated adhesive areas, locating a glove comprising a waterproof, vapour permeable membrane over the film, heating so as to degrade the film and provide a plurality of isolated areas of adhesive bonding the membrane to the inner sleeve, the method further comprising the step of providing an outer protective layer over the membrane.
2. A method of making a glove as claimed in claim 1, wherein the adhesive film is glove shaped.
3. A method of making a glove as claimed in claim 1 or claim 2, wherein the adhesive film comprises a web of thermoplastic adhesive.
4. A method of making a glove as claimed in claim 3, wherein the web comprises polyamide.
5. A method of making a glove as claimed in any preceding claim, wherein the method is carried out by locating the successive layers of the glove on a former.
6. A method of making a glove as claimed in claim 5, wherein the former is made from ceramic or metal.

7. A method of making a glove as claimed in any preceding claim, wherein an additional glove shaped layer is located over the vapour permeable membrane during manufacture in order to ensure that the membrane is held tightly against the adhesive during heating.
8. A method of making a glove as claimed in any preceding claim, wherein the outer protective layer comprises leather.
9. A method of making a glove as claimed in any preceding claim, wherein the outer protective layer is secured in place by a heat degradable film.
10. A method of making a glove as claimed in any preceding claim, wherein the outer protective layer is secured in place by providing tabs at the fingertips of the membrane and/or the fingertips of the inside of the outer protective layer, the tabs of the membrane and/or protective layer being secured together.
12. A glove comprising an inner liner, a waterproof, vapour permeable membrane secured thereto and an outer protective layer located above the membrane, characterised in that the membrane is secured to the inner liner by a plurality of isolated areas of adhesive.

## Relevant Technical Fields

(i) UK Cl (Ed.N) A3V (VIAICI, VSZ)  
 (ii) Int Cl (Ed.6) A41D

Search Examiner  
M J DAVEY

## Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Date of completion of Search  
17 OCTOBER 1995

(ii) ONLINE: WPI

Documents considered relevant following a search in respect of Claims :-  
1-12

## Categories of documents

X: Document indicating lack of novelty or of inventive step.  
 Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.  
 A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.  
 E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.  
 &: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

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